

<b>Proposal # 2001- <u>K203</u></b> (Office Use Only)
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**PSP Cover Sheet** (Attach to the front of each proposal)

Proposal Title: Merced River Water Temperature Management Feasibility Study  
 Applicant Name: Merced Irrigation District  
 Contact Name: Ted Selb  
 Mailing Address: P.O. Box 2288, 720 W. 20th St., Merced, CA 95344-0288  
 Telephone: (209) 722-5761  
 Fax: (209) 722-6421  
 Email: tselb@mercedid.org

Amount of funding requested: \$ 395,000

Some entities charge different costs dependent on the source of the funds. If it is different for state or federal funds list below.

State cost \_\_\_\_\_

Federal cost \_\_\_\_\_

Cost share partners? \_\_\_\_\_ Yes \_\_\_\_\_ X NoIdentify partners and amount contributed by each \_\_\_\_\_  
\_\_\_\_\_

Indicate the Topic for which you are applying (check only one box).

- |  |   |
|--|---|
| <input type="checkbox"/> Natural Flow Regimes                | <input type="checkbox"/> Beyond the Riparian Corridor                           |
| <input type="checkbox"/> Nonnative Invasive Species          | <input type="checkbox"/> Local Watershed Stewardship                            |
| <input type="checkbox"/> Channel Dynamics/Sediment Transport | <input type="checkbox"/> Environmental Education                                |
| <input type="checkbox"/> Flood Management                    | <input type="checkbox"/> Special Status Species Surveys and Studies             |
| <input type="checkbox"/> Shallow Water Tidal/ Marsh Habitat  | <input checked="" type="checkbox"/> Fishery Monitoring, Assessment and Research |
| <input type="checkbox"/> Contaminants                        | <input type="checkbox"/> Fish Screens   |

What county or counties is the project located in? Merced and MariposaWhat **CALFED** ecozone is the project located in? See attached list and indicate number. Be as specific as possible East San Joaquin Basin Ecological Management Zone

Indicate the type of applicant (check only one box):

- |  |   |
|--|---|
| <input type="checkbox"/> State agency  | <input type="checkbox"/> Federal agency |
| <input type="checkbox"/> Public/Non-profit joint venture                     | <input type="checkbox"/> Non-profit     |
| <input type="checkbox"/> Local government/district                           | <input type="checkbox"/> Tribes         |
| <input type="checkbox"/> University  | <input type="checkbox"/> Private party  |
| <input checked="" type="checkbox"/> Other: <u>Public Agency - Tax Exempt</u> |   |

Indicate the primary species which *the* proposal addresses (check **all** that apply):

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> San Joaquin and East-side Delta tributaries fall-run chinook salmon | <input type="checkbox"/> Spring-run chinook salmon  |
| <input type="checkbox"/> Winter-run chinook salmon  | <input type="checkbox"/> Fall-run chinook salmon    |
| <input type="checkbox"/> Late-fall run chinook salmon   | <input type="checkbox"/> Longfin smelt              |
| <input type="checkbox"/> Delta smelt  | <input checked="" type="checkbox"/> Steelhead trout |
| <input type="checkbox"/> Splittail  | <input type="checkbox"/> Striped bass               |
| <input type="checkbox"/> Green sturgeon   | <input type="checkbox"/> All chinook species        |
| <input type="checkbox"/> White Sturgeon   | <input type="checkbox"/> All anadromous salmonids   |
| <input type="checkbox"/> Waterfowl and Shorebirds   | <input type="checkbox"/> American shad              |
| <input type="checkbox"/> Migratory birds  |   |
| <input type="checkbox"/> Other listed TIE species: _____  |   |

Indicate the type of project (check only **one box**):

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> Research/Monitoring | <input type="checkbox"/> Watershed Planning |
| <input type="checkbox"/> Pilot/Demo Project             | <input type="checkbox"/> Education          |
| <input type="checkbox"/> Full-scale Implementation      |   |

Is this a next-phase of an ongoing project? Yes \_\_\_\_\_ No X

Have you received funding from CALFED before? Yes \_\_\_\_\_ No X

If yes, list project title and CALFED number \_\_\_\_\_

Have you received funding from CVPIA before? Yes \_\_\_\_\_ No X

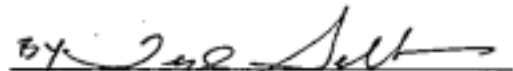
If yes, list CVPIA program providing funding, project title and CVPIA number (if applicable):  
\_\_\_\_\_

By signing below, the applicant declares the following:

- The truthfulness of all representations in their proposal;
- The individual signing the form is entitled to submit the application on behalf of the applicant (if the applicant is an entity or organization); and
- The person submitting the application has read and understood the conflict of interest and confidentiality discussion in the PSP (Section 2.4) and waives any and all rights to privacy and confidentiality of the proposal on behalf of the applicant, to the extent as provided in the Section.

Ross Rogers, General Manager

Printed name of applicant

  
Signature of applicant

## **B. Executive Summary**

**Project Title:** Merced River Water Temperature Management Feasibility Study

**Amount Requested:** \$395,000

**Applicant:** Merced Irrigation District, P.O. Box 2288, 720 W. 20<sup>th</sup> Street, Merced, CA 95344-0288; Phone: (209) 722-5761, FAX: (209) 722-6421; Contact Person: Edward C. Selb, Assistant General Manager (E-mail: [tselb@mercedid.org](mailto:tselb@mercedid.org))

**Participants and Collaborators:** Merced River Technical Advisory Committee (Merced TAC); Merced Irrigation District (Merced ID); California Department of Fish and Game (CDFG); U.S. Fish and Wildlife Service (USFWS); National Marine Fisheries Service (NMFS); Natural Resource Scientists, Inc. (NRS, Inc.); Merced River Stakeholder Group; Engineering firm to be selected by competitive bid.

**Project Summary:** The Merced River is presently the southern-most Central Valley river inhabited by anadromous salmonids and is consequently subject to longer warm seasonal periods than more northerly streams. The Merced River's watershed has been significantly altered by anthropogenic factors which influence the thermal regime of the river. Elevated water temperature, particularly during the fall and spring months, has been identified among a set of factors as one principal factor that can limit fall-run chinook salmon production in the Merced River. Complex hydraulics and thermodynamics in the four mainstem Merced River reservoirs significantly affect the ultimate water temperature regime in the salmon spawning and rearing reach of the Merced River. These circumstances create considerable uncertainties as to the most effective measures to improve the water temperature regime for salmonids; this proposal is intended to resolve those uncertainties. Existing records, data, and modeling efforts addressing water temperature issues for the Merced River are not sufficient at this time to allow comprehensive quantitative analysis of potential remedial actions. The primary objective of our proposed study is to develop and evaluate effective options for water temperature management in the Merced River to improve conditions for anadromous salmonids, principally during the fall and spring seasons. This objective supports near- and long-term views for successful implementation of the ERPP by pursuing: 1) to provide suitable habitat conditions to conserve and restore an at risk species (ERPP Goal 1), the San Joaquin basin fall-run chinook salmon; and 2) to evaluate system flexibility to meet other desired ecosystem objectives while ensuring that flow and water temperature can be optimized. Effective measures that avoid the impacts of warm water temperatures in the lower Merced River have the potential to measurably improve chinook salmon production. This water temperature feasibility study will focus on the following tasks:

- 1) Compile and summarize pertinent physical project specifications, operating strategies and requirements, related agreements, and existing thermal and flow information and biological monitoring activities in the four Merced River reservoirs and the lower Merced River.
- 2) Develop potential alternatives and recommend one to three alternatives that may improve temperature management for anadromous salmonids in the Merced River.
- 3) Develop a joint Merced ID/CDFG proposal for seeking and securing funds to design, permit, construct and operate the preferred temperature management alternative(s).

## C. Project Description

### 1. Statement of the Problem

The Merced River is presently the southern-most tributary stream in the Central Valley inhabited by anadromous salmonids and is consequently subject to longer warm seasonal periods than more northerly streams. The Merced River, its channel, watershed and riparian corridor, has been significantly altered by gold and gravel mining; dam construction for power production, irrigation, and flood control; agriculture; and urbanization (CDFG 1993, USFWS 1995, USBR 1997), which influence the thermal regime of the river. Compared to their historic access to spawning and rearing habitat in higher elevation river reaches (USFWS 1995, Yoshiyama et al. 1996, Yoshiyama 1999), chinook salmon are restricted during all of their freshwater life stages to utilize the lower Merced River up to Crocker-Huffman Dam (River Mile 52), which is the upstream barrier for fish migration and the location of the Merced River Hatchery. Crocker-Huffman Dam along with three upstream dams (Merced Falls Dam, McSwain Dam, and New Exchequer Dam proceeding in an upstream direction) regulate flows in the lower Merced River. Reservoir storage levels, dam operations, and water discharge volumes have important interactive effects on river temperatures along with other environmental conditions such as (in order of relative importance): air temperatures, riparian shade, accretion volumes and temperatures, channel width, depth ratio, solar radiation, wind, humidity, and ground conduction (Theurer et al. 1984, Bartholow 1989).

Elevated water temperature, particularly during the early fall and late spring months, has been identified among a set of factors as one principal factor that can limit fall-run chinook salmon (*Oncorhynchus tshawytscha*) production in the lower Merced River and at Merced River Hatchery (CDFG 1993, USFWS 1995, BOR 1997, NMFS 1998, CalFed 1999a,b). Recent sampling by Natural Resource Scientists, Inc. and Merced ID has demonstrated that over-summer rearing of fall chinook salmon does occur in a limited reach of the Merced River. Provision of suitable water temperatures in the Merced River, partially a function of reservoir operation conditions, may be affected by various demands on water supplies including ecosystem management flows such as the Vernalis Adaptive Management Plan (VAMP). Also, designated critical habitat within the San Joaquin Basin for the federally-listed threatened Central Valley ESU (evolutionarily significant unit) steelhead (*Oncorhynchus mykiss*) may be potentially affected by seasonally elevated water temperatures in the lower Merced River as defined by the federally mandated determination (NMFS 2000).

The primary objective of our proposed study is to develop and evaluate effective options for water temperature management in the Merced River to improve conditions for anadromous salmonids, principally during the fall and spring seasons. This objective supports near- and long-term views for successful implementation of the ERPP by pursuing: 1) to provide suitable habitat conditions to conserve and restore an at risk species (ERPP Goal 1), the San Joaquin basin fall-run chinook salmon; and 2) to evaluate system flexibility to meet other desired ecosystem objectives while ensuring that flow and water temperature can be managed to favor the native aquatic species in terms of seasonal timing, duration, and geographic scope within the Merced

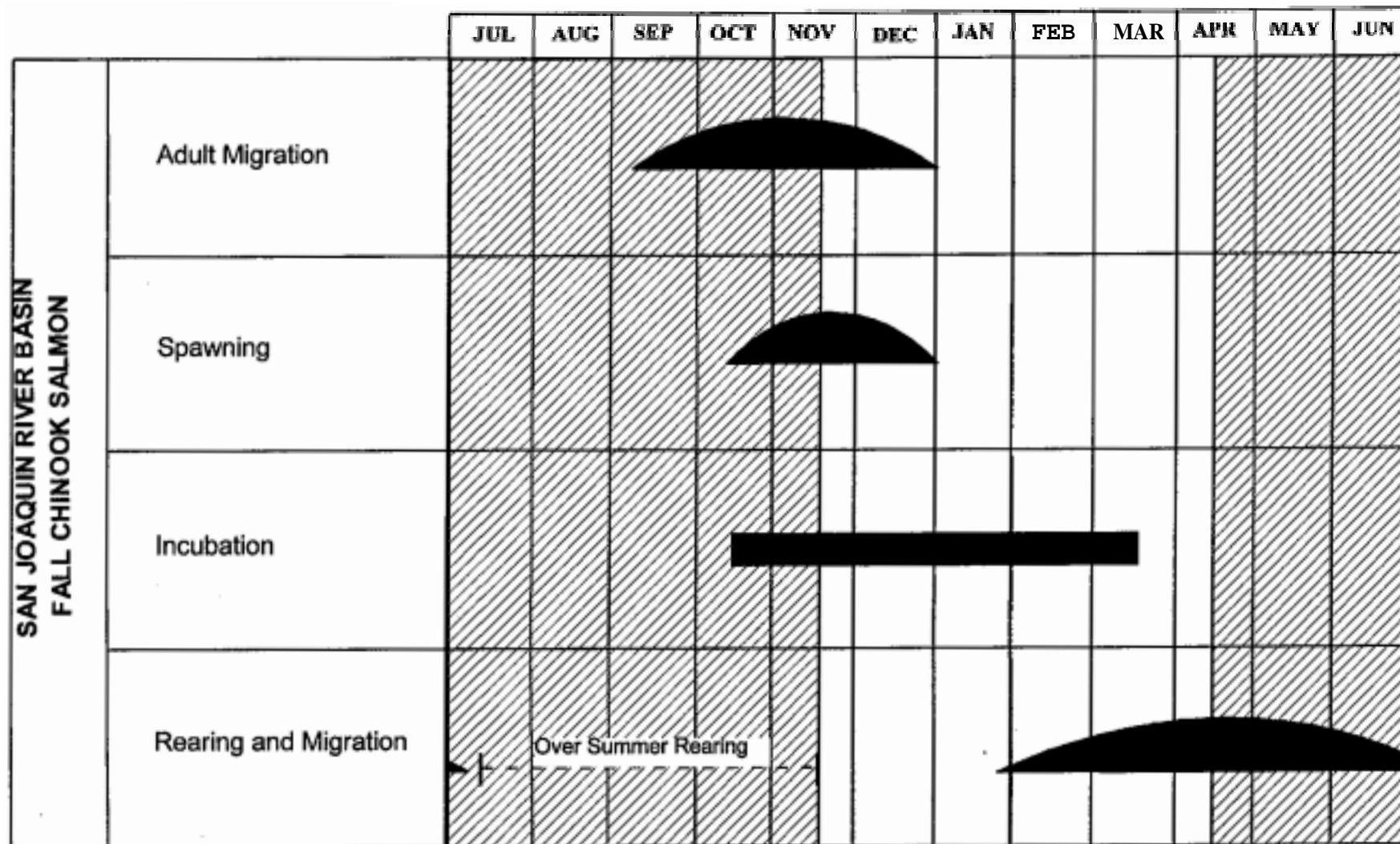
River basin.

### **b. Conceptual Model**

The life history phenology (timing) of fall-run salmon in the Merced River is characteristic of that for the San Joaquin River basin (Figure 1) (CDFG 1993). Elevated water temperatures in the lower Merced River may result in delayed salmon spawning, decreased egg survival, and increased juvenile mortality. Stream temperatures in some portions of the spawning reach and at Merced River Hatchery can exceed widely recognized temperature tolerances for salmon spawning and egg incubation in October and early November (Figure 2). Elevated water temperature can affect spawning migration rates, alter the incidence of disease, and delay or accelerate spawning to the detriment of reproductive performance (Marine 1993). In recent drought years, salmon have not spawned until after the first week in November, when water temperatures have cooled, through the effect of declining ambient air temperatures, to suitable levels for egg incubation. In more-recent wet years, spawning occurred in October. In late April and May, water temperature often exceeds recognized stressful levels for emigrating smolts (Figures 1 and 2). Elevated spring time temperatures are a more frequent and significant problem on the lower Merced River than other chinook salmon streams, even in the San Joaquin River basin, because of its most southerly latitude in the range of chinook salmon and consequent higher air temperatures. Warm water temperatures create conditions in the natural and hatchery environment that are conducive to many salmon pathogens resulting in many types of diseases or infections that reduce fitness or cause mortality (Piper et al. 1982, Marine 1993, Fagerlund et al. 1995, NMFS 1998). This is most evident in hatchery populations but can occur in the Merced River as well (B. Loudermilk, CDFG, pers. comm.). In many years, production at Merced River Hatchery is impaired by warm water temperatures in the fall, late spring and summer months (M. Cozart, CDFG, pers. comm.).

Existing records, data, and modeling efforts addressing water temperature issues for the Merced River are not sufficient at this time to allow comprehensive quantitative analysis of the potential for impacts of proposed conservation/restoration actions on Merced River temperatures. A temperature model for the Merced River was developed in 1995 (JSA 1995) as part of CDFG's Merced River investigations; however, the utility of this model is currently limited since it has yet to be calibrated and dam operations specifications remain to be assessed.

Our approach to addressing temperature management issues for the Merced River stems from the conceptual model shown in Figure 3) which was adapted from Theurer et al. (1984). A number of factors affect river temperatures below the dams on the Merced River. Some of these factors may be manipulated to improve thermal conditions at certain times of the year to benefit anadromous salmonids restricted to spawn and rear below the dams, while balancing water supply and other ecosystem functions supported by the Merced River. The storage level of Lake McClure is a primary factor affecting temperature of water released into the Merced River at New Exchequer Dam. Reservoir levels affect the temperature of water at the dam's outlet along with season of the year, annual runoff pattern, and air temperature variations. The level of the reservoir affects the volume of cold water in the hypolimnion which forms in the deepest layers



LEGEND:



DENOTES PRESENCE AND RELATIVE MAGNITUDE



DENOTES ONLY PRESENCE

Figure 1. Life history phenology of San Joaquin Basin fall-run chinook salmon showing seasons of water temperature limitations (shaded area).

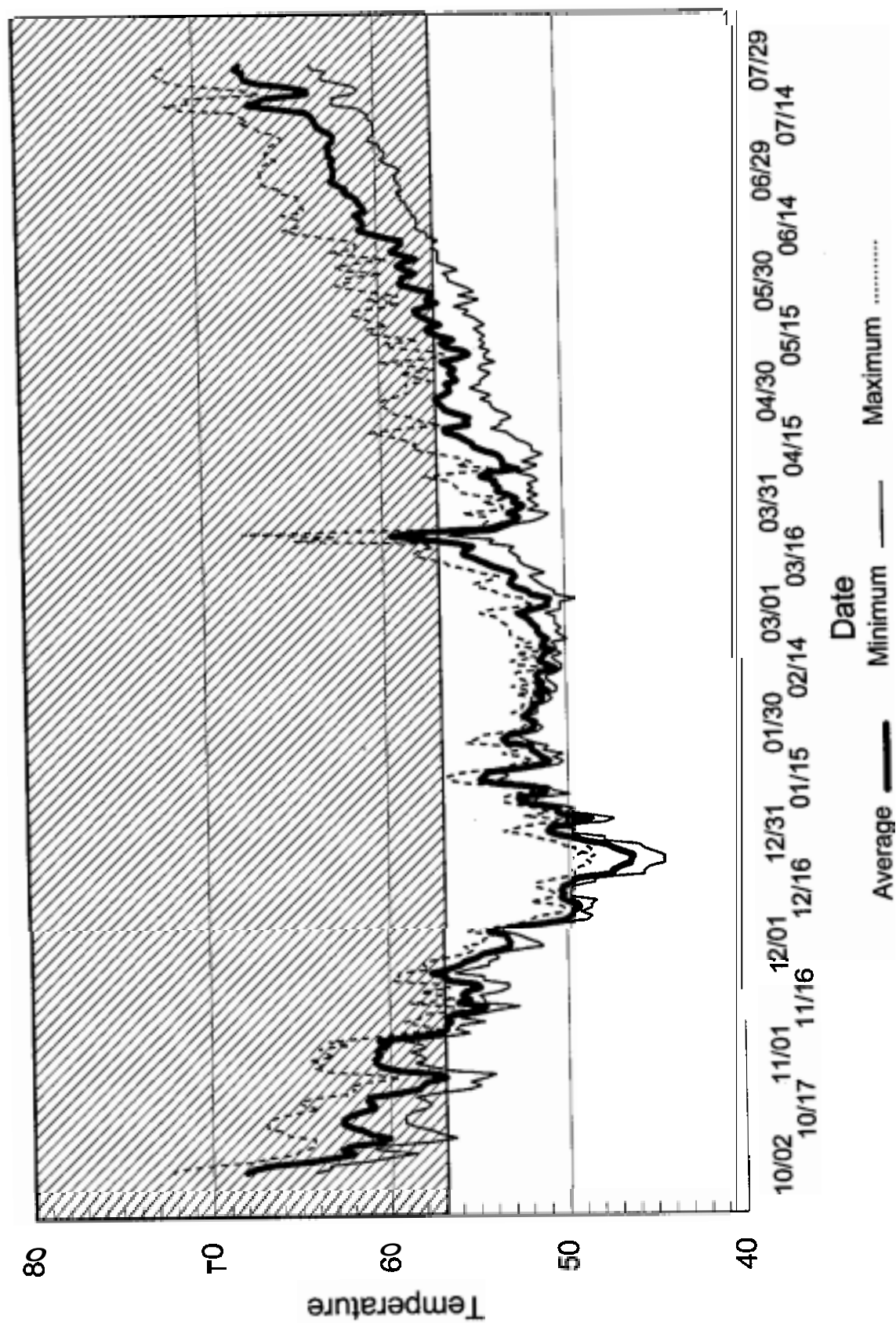


Figure 2. Water temperatures recorded at river mile 42 in the Merced River (October 1997 - July 1998) showing the range of concern for elevated temperature effects on anadromous salmonid spawning and rearing (shaded area).

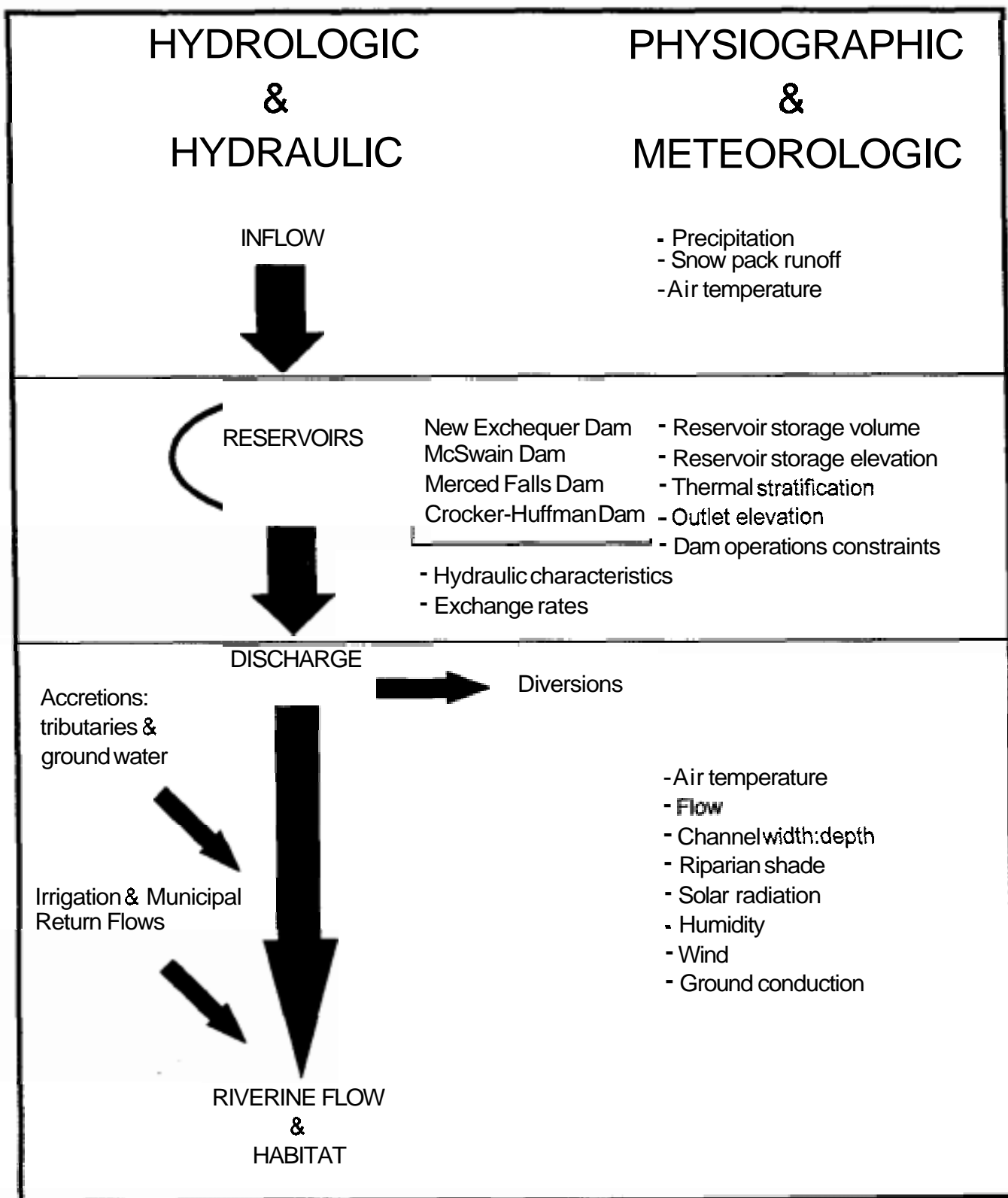


Figure 3. Conceptualization of principal hydrologic, hydraulic, physiographic, and meteorologic factors affecting water temperatures of the lower Merced River aquatic habitats.



of the reservoir upon thermal stratification during the late spring, summer, and early fall months. Surface water warmed by the air and solar radiation during the spring and summer “floats” on top of the cooler, denser water of the hypolimnion. The depth of this warmer surface layer can vary but is generally 5 and 15 meters deep (about 15 and 45 feet) in most California reservoirs. Once thermal stratification breaks down during the early fall months, the warmer surface and cooler hypolimnion waters mix and reservoir temperature becomes almost uniform throughout its depth and comes to a dynamic equilibrium with inflow and air temperatures until stratification reoccurs in spring. Unlike other Central Valley reservoirs that are relatively easy to model and control water temperatures in downstream salmon reaches (e.g., Shasta Reservoir), the three re-regulating reservoirs downstream of Lake McClure (each with its own unique characteristics) significantly increase the complexity for controlling water temperatures to benefit salmon in the Merced River. Therefore, there are uncertainties as to the feasibility and effectiveness among potential options for structural and/or operations measures to improve water temperatures for anadromous salmonids in the river downstream of the four dams and reservoirs.

The temperature of the river as it flows downstream is primarily modulated by air temperature, flow accretions and depletions, channel morphology, riparian shading, and secondarily by solar radiation, humidity, and wind. Each of these factors has an incremental and interactive effect with the others on the ultimate water temperature regimes exhibited at various points and aquatic habitats along the river. So, within certain limits, incremental improvements of thermal conditions for portions of the river may be affected through dam design and flow management, return flow management, channel restoration and management, and restoration and conservation of riparian shading habitats. Restoration and management of channel morphology and its supporting physical processes, and riparian habitat are currently being addressed through projects previously funded by CalFed (Merced County’s *Merced River Corridor Restoration Plan/Project*, CDWR’s *Merced River Salmon Habitat Enhancement*, and CDFG’s *Merced River Land Acquisitions and Phase 3 Merced River Salmon Habitat Enhancement*). Our proposed study will address the issues related to reservoir and dam operations to allow development of a comprehensive water temperature management plan for the lower Merced River.

### **c. Hypothesis Addressed and Adaptive Management Considerations**

Our proposal addresses ecosystem management questions associated with managing anthropogenic alterations of riverine physical processes compatible with desired future ecosystem-state conditions for Central Valley salmon production. The Merced River as a highly altered and regulated riverine ecosystem has functionally isolated the lower, valley reach of the Merced River from its upstream watershed in the foothills and mountains of the Sierra Nevada. Dam construction has altered the flow and water temperature regime in river reaches downstream of the four mainstem dams on the Merced River. These alterations have changed the river’s natural ecological processes and affected the habitat available for salmonids. Although water released into the Merced River is released from the hypolimnion at the bottom of Lake McClure, complex hydraulics and thermodynamics in the three downstream reservoirs from New Exchequer Dam significantly affect the ultimate water temperature regime in the salmon spawning and rearing reaches of the lower Merced River. Effective conservation



measures that avoid the impacts of warm water temperatures in the lower Merced River and at Merced River Hatchery have the potential to measurably improve chinook salmon production. With the participation of the Merced River Project in the VAMP to meet ecosystem hydrologic objectives in the Delta and planned flow augmentation in the Merced River to potentially meet the needs of early returning salmon into the Merced River, it will be important to assess if cold water supplies for release to the river and water temperatures are suitable for those fish that spawn early in the fall season and rear and outmigrate during the spring season.

The primary hypothesis to be evaluated by our proposed study is that water temperatures in the lower Merced River can be effectively managed and improved to benefit chinook salmon through operational

**Hypothesis: Water temperatures in the lower Merced River can be effectively managed and improved to benefit anadromous salmonids through operational and/or structural measures at the four mainstem Merced River reservoirs and dams.**

and/or structural measures at the four mainstem Merced River reservoirs and dams. As a feasibility study, we expect to refine and better specify our conceptual model through this investigation (step 3 - step 4 in the adaptive management process described in the 2001 PSP, page 15) to provide a sound basis for implementation of specific restoration actions for managing water temperatures. To a certain extent, we will rely on recent experience involved with development of temperature control for Shasta Dam on the Sacramento River (BOR 1992) although we recognize that the Merced River is considerably more complex because of its four mainstem reservoirs. Uncertainties associated with the engineering and hydrologic issues of dam and reservoir operations pertaining to temperature management will be resolved through analyses to be performed during one phase of our study. Existing data on water project operations and water temperature collected by Merced ID and other agencies and data developed and analyzed during this project (described in the Project Approach section) will be used to resolve the uncertainties associated with the most appropriate measures to improve the temperature regime for anadromous salmonids. The results of these analyses are expected to provide the necessary 'feedback' to our conceptual model in order to identify the most efficient and effective suite of actions for temperature management on the lower Merced River. Until the uncertainties are resolved, it is not possible to implement actions to optimize water operations and water temperature management to benefit anadromous salmonids in the lower Merced River. Some combination of the identified suite of actions will be pursued for implementation as a final phase of this proposed project, which is analogous to step 4 of the adaptive management process described in the 2001 PSP.

## **2. Proposed Scope of Work**

### **a. Location and/or Geographic Boundaries of the Project**

This water temperature feasibility study will focus on New Exchequer Dam and Lake McClure (Rh4 62), McSwain Re-regulation Dam and Lake McSwain (RM 56), the impoundment at Merced Falls Diversion Dam (RM 55), the impoundment at Crocker-Huffman Diversion Dam (RM 52), and the lower Merced River to its confluence with the San Joaquin River (Figure 4).

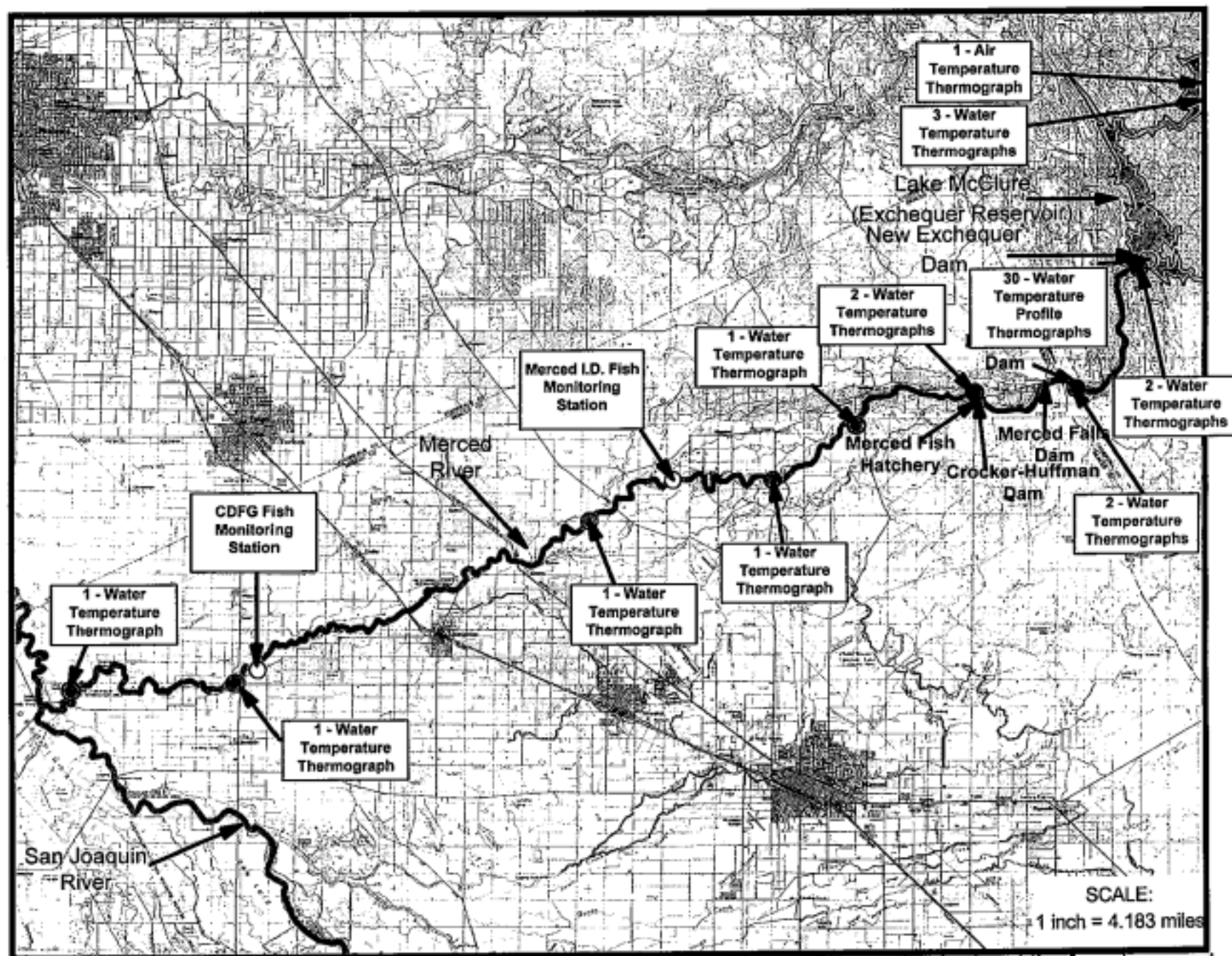


Figure 4. Locations of temperature and fish monitoring stations in the Merced River watershed and the four dams and reservoirs.

The Merced River Hatchery is also an important element of this study's focus since its water supply is drawn from the impoundment at Crocker-Huffman Dam (Figure 4). Each of the Merced River Project elements that are the focus of this study are located in the Merced River ecological management unit of the East San Joaquin Basin Ecological Management Zone. Features of the Merced River Project upstream of RM 55 are located in Mariposa County, while those downstream of RM 55 are located in Merced County.

**b. Project Approach**

***Task 1: Compile and summarize pertinent physical project specifications, operating strategies and requirements, related agreements, and existing thermal and flow information and biological monitoring activities in the four Merced River reservoirs and the lower Merced River.***

Task 1 is the first step in development of comprehensive water temperature management plan for the lower Merced River. This initial task will compile all pertinent physical and biological data and analyses regarding Merced ID's Merced River Development Project and water temperature in the fall, winter, spring, and summer months. As a portion of Merced ID's cost-sharing for this project, Merced ID will continue and expand its data collection efforts (initiated in 1997) to calibrate CDFG's water temperature model (Figure 4). Information developed for CDFG's water temperature model, Merced ID's reservoir characteristics and operations plan(s) and models, and all associated physical information, requirements and agreements that need to be considered will be compiled into a peer-reviewed Reconnaissance Study Report. Any additional information needs that will hinder progress in the subsequent Task 2 (described below) will be identified in this report. Task 1 will be conducted within a one-year period and could be separable from Tasks 2 and 3; portions of Task 4 and 5 applicable to Task 1 are not separable from Task 1.

***Task 2: Develop potential alternatives and recommend one to three alternatives that may improve temperature management for chinook salmon (a) in the Merced River and (b) at Merced River Hatchery.***

Task 2 is the second step in the development of improved temperature management on the lower Merced River and at Merced River Hatchery. Task 2 will require 1% years following the initial study (Task 1). Depending on results from analyses, the report will provide a basis for Merced ID and other involved agencies (e.g., CDFG) to jointly pursue funding to ultimately construct and operate facilities to improve water temperature management. A contractor familiar with reservoir operations to improve temperature management would be retained by Merced ID following review of "Request for Proposals" by the Merced TAC and selection by the Management Committee (described in "Local Involvement"). This process will solicit at least 3 competitive bids according to CalFed guidelines. Information gathered in Task 1 will be considered in the development of a range of specific temperature management improvement alternatives. Details for each alternative will be developed in sufficient detail to select one to three of the best alternatives for further development in the later phase of this study. It is possible that one alternative may satisfy a portion of the temperature management needs in the Merced River and the Merced River Hatchery. However, other alternatives may treat these two

issues separately during all or a portion of certain water year types. A final Feasibility Report will identify one or more preferred alternatives, define any additional work necessary or problems associated with these alternatives, and provide preliminary costs estimate(s) for design plans, permitting, construction and operation of the preferred alternative(s).

***Task 3: Develop a joint Merced ID/CDFG proposal for seeking and securing funds to design, permit, construct and operate the preferred water temperature management alternative***

In the event that effective and reasonable alternatives exist, Task 3 is the next logical step following Tasks 1 and 2. Task 3 is the process of developing a comprehensive solution to temperature management on the Merced River should effective and reasonable alternatives emerge from the preceding tasks. A contractor would be retained (using the same competitive bidding process to that in the previous task) to prepare a detailed proposal and assist the parties in pursuing and securing the necessary funding to proceed. The desired end result would be funding to permit and construct the preferred project(s). The parties could then proceed in an expeditious manner to construct and operate projects that improve temperature management for anadromous salmonids on the lower Merced River. Task 3 will take 3 months to complete.

***Task 4: Development of a Monitoring Plan.***

A monitoring plan according to CalFed guidelines will be developed with CDFG, NMFS, and the USFWS within the first month of this project. Additional detail is provided in the "Monitoring and Data Collection Methodology" section of this proposal. Development of the monitoring plan task is included in this proposal's budget.

***Task 5: Project Management***

Merced ID will manage the project cost and schedule, administer grant funds, develop work plans, coordinate with other related activities, coordinate and oversee the activities of the project team, communicate with agency staff, and provide financial reports to CalFed or the CalFed contract administrator. The project manager will ensure that project team members have the resources needed to perform the tasks. The applicant will prepare quarterly reports summarizing degree of completion, activities during the reporting period, costs incurred, project milestones, and additional information described in the CalFed 2001 Proposal Solicitation Package. The project management task is provided by Merced ID as an in-kind contribution to this project.

**c. Monitoring Plan and Data Collection and Evaluation Approach**

Included in this proposal's scope of work and budget is the development of a project monitoring plan that will be developed in collaboration with CalFed, CDFG, USFWS, and NMFS staff. As a feasibility study, this project does not include specific monitoring methodologies. It will, however, compile and evaluate existing biological and physical data and information collected through current biological monitoring projects on the Merced River. Data and results from CDFG's water temperature model, Merced ID's reservoir characteristics and operations plan(s) and models, and all associated physical information, requirements and agreements will be compiled. Biological monitoring projects include the CVPIA's Comprehensive Assessment and Monitoring Program juvenile salmonid emigrant trapping data collected by CDFG on the

lower Merced River, as well as other ongoing biological surveys and monitoring overseen by CDFG and the Merced River TAC. Daily water operations data will also be compiled as part of this evaluation. The feasibility study will also include an evaluation of pertinent historical water project operations information, stream flows, and water temperature data collected by Merced ID, CDFG, and the California Department of Water Resources. The Merced TAC will provide technical assistance and peer review of analyses and draft reports.

#### **d. Expected Work Products**

Progress reports will be prepared quarterly according to CalFed guidelines. Periodic status reports will be given to the Merced TAC and the watershed stakeholder group. A technical, peer-reviewed report for Task 1 will be completed prior to initiating Task 2. The report will compile, analyze, and summarize data and information developed for CDFG's water temperature model, Merced ID's reservoir characteristics and operations plan(s) and models, and all associated physical information, requirements and agreements that need to be considered during Task 2. An engineering report will be completed for Task 3. The Task 3 Engineering Report is expected to identify the structural and/or operational measures at the four mainstem Merced River dams and reservoirs necessary to optimize water temperature regimes for salmonids downstream of Crocker-Huffman Dam. Task 4 (Monitoring Plans) will be completed for Tasks 1 and 2. Completion of Task 3 will be a formal Merced ID/CDFG plan for pursuing funding and implementation of the preferred alternative. The project manager will prepare a program progress report annually with a summary of project results for each year. A final report will be prepared at the end of the project.

#### **e. Work Schedule**

The schedule for implementation of the Merced River Water Temperature Feasibility Study is given in Table 1. Task 1 would be implemented within a one-year period followed by a final report for Task 1. Task 1 could be separately funded from Tasks 2 and 3 if funding for these latter tasks was not available. Task 2 is dependent on the outcome of Task 1 and would be implemented over a nine-month period followed by a final engineering report. Tasks 1 and 2 could be funded in combination and could be independent from Task 3. Task 3 is dependent on the outcome of Task 2 and would be implemented over a 3-month period immediately following Task 2 followed by a final report. Task 4, development of a project monitoring plan, would be implemented in the first month of Tasks 1 and 2. Task 5, Project Management, would occur continuously for the duration of the entire project. Quarterly reports would be completed and submitted to CalFed each month following the quarterly periods.

#### **g. Feasibility**

Cooperation and coordination for water resource management on the Merced River have been facilitated through several recent interagency negotiations. All parties with the facilities ownership and operations and resource management authorities necessary to address water temperature management in the Merced River will collaborate on this project. All work will be coordinated between the Merced ID, CDFG, USFWS, and NMFS through the Merced TAC. Access to the necessary water project facilities' physical and operations specifications, related

Table 1. Schedule for Implementation of the Merced River Water Temperature Feasibility Study

Task	2001												2002											
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
1																								
2																								
3																								
4																								
5																								
Final Reports																								
Quarterly Reports																								
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
	2001												2002											

Task 1: Compile and summarize pertinent physical project specifications, operating strategies and requirements, related agreements, and existing thermal and **flow** information and biological monitoring activities in the four Merced River reservoirs and the lower Merced River

Task 2: Develop potential alternatives and recommend one to three alternatives that may improve temperature management for chinook salmon (a) in the Merced River and (b) at Merced River Hatchery

Task 3: Develop a joint Merced ID/CDFG proposal for seeking and securing funds to design, permit, construct and operate the preferred water temperature management alternative(s).

Task 4: Development of a Monitoring Plan

Task 5: Project Management

agreements, existing temperature data, stream flow records, and biological data and monitoring information is available through these originating parties. Additionally, coordination with the parties currently funded through CalFed to develop a Merced River Corridor Restoration Plan, Merced County Planning and Community Development Department, will be accomplished through the Stakeholder Group process of that project and the Merced TAC. No permits will be required for the tasks to be performed by this proposed project. The project team has the expertise and support services necessary (see Qualifications) to perform the proposed tasks within the proposed time line.

## **D. Applicability to CalFed's ERP Goals and Implementation Plan and CVPIA Priorities**

### **1. ERP Goals and CVPIA Priorities**

This project specifically contributes to the ERPP Strategic Objective for creating flow and temperature regimes in regulated rivers that favor native aquatic species (ERPP v.1, p. 63). It focuses on systematic evaluation of the Merced River Project to design an implementation strategy to fulfill the general ERPP Vision: "...Sustaining adequate temperatures below reservoirs and power diversion dams is needed to provide coolwater anadromous fish habitat within the existing Central Valley multipurpose water resources management framework. Flexibility in managing stream temperatures will be an important ingredient in the successful restoration of Central Valley natural resources" (ERPP v. 1, p.60). This project directly addresses the ERPP Vision for Ecological Processes in the East San Joaquin Basin Ecological Management Zone related to stream temperatures in the Merced River: "... Improving water temperatures in the three rivers (Stanislaus, Tuolumne, and Merced) below the major reservoirs in this zone can contribute to the overall ecological health of the system and promote sustainable fisheries. ...The vision for water temperatures in these rivers is to provide sufficient summer and early-fall base flows in the river channels and restore the riparian corridors and natural stream channel characteristics that limit heating of the rivers. Storing sufficient coolwater in the reservoirs during drought will also help maintain a minimum coolwater habitat in the rivers." (ERPP v.2, pp. 424-425). In addition, the USFWS's AFRP has identified water temperature management on the Merced River as a high priority resource management issue (USFWS 1995). Also, the CalFed 2001 Proposal Solicitation Package specifically identifies Merced River water temperature issues: "...assessment of reservoir operations and/or the use of temperature control devices in the Stanislaus, Tuolumne, and Merced rivers to improve temperatures for chinook salmon spawning and steelhead rearing..." (2001 PSP, p. 47). The CalFed 2001 PSP states that this action has been identified by the Ecosystem Restoration Program as having the potential to address Goal 1 (2001 PSP, p. 48).

### **2. Relationship to Other Ecosystem Restoration Projects**

The biological and physical feasibility assessment tasks of our proposal will provide information that is expected to be useful to the Merced County's Merced River Corridor Restoration Project that was funded by CalFed during 1998. Integration of the shaded riparian habitat and channel maintenance benefits expected from stream corridor restoration projects with options for improved stream temperature management that emerge from this project's assessments will be



ultimately important for achieving a coordinated temperature management solution for the lower Merced River. Our results will also directly benefit both CDWR's and CDFG's CalFed and AFRP funded salmon habitat enhancement projects. Our proposal serves to support these ecosystem objectives through comprehensive evaluation of options to assure compatible, balanced management of improved flow and water temperature regimes on the Merced River to benefit anadromous salmonids.

### **3. System-Wide Ecosystem Benefits**

Habitat and water quality degradation exacerbated by reduced flows in the lower San Joaquin River and the Delta along with the effects of the large CVP and SWP water diversions and numerous local diversions throughout the Delta have been attributed to declines in a number of fish species that inhabit or migrate through the Delta. The 1995 Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary, Delta Smelt Biological Opinion, and CVPIA's Revised Anadromous Fish Restoration Plan call for increased instream flows on the lower San Joaquin River with specific seasonal flow objectives at Vernalis where the San Joaquin River enters the Delta.

The CVPIA requires that all reasonable efforts to ensure that by the year 2002 natural production of anadromous fish in Central Valley rivers will be sustainable on a long-term basis, at levels not less than twice the average levels attained during the period 1967-1991. One element of the CVPIA, the Anadromous Fish Restoration Program, has need for provision of water of the appropriate temperature from the San Joaquin tributaries to increase flows on the lower San Joaquin River at times to benefit fish and wildlife. The AFRP also specifically identifies the water temperature management on the Merced River as a high priority. The CVPIA authorizes the Bureau of Reclamation to obtain additional flows on the Stanislaus, Tuolumne, Merced, and lower San Joaquin rivers that will facilitate migration, attraction, production, and survival of anadromous fish on these river in accordance with specific fish, wildlife, and habitat restoration purposes of the Act. The Bureau of Reclamation proposes to contract water on the San Joaquin River and tributaries to meet the needs of fish and wildlife within the San Joaquin Valley while pursuing to achieve a reasonable balance among competing demands for CVP water for all authorized uses including fish and wildlife. The provision of Merced River water to downstream areas will contribute, in part, to these multi-purpose beneficial uses while concurrently ensuring that in-basin needs are met, including the appropriate thermal regime.

Merced Irrigation District is a signatory to the San Joaquin River Agreement which, among other things, implements the Vernalis Adaptive Management Plan (VAMP). Under the VAMP, effects of flow and export from the Sacramento/San Joaquin River Delta upon salmon will be investigated. As part of that agreement, increased flows in the spring and fall will be provided in the Merced, Tuolumne, and Stanislaus Rivers, more than 50 percent of which is to be supplied by Merced Irrigation District. Such flows are to be provided during an April/May pulse flow and during October. This proposed project will provide integral information to the VAMP that will allow Merced Irrigation District to manage their water supplies in an optimal and flexible manner to meet VAMP while concurrently fulfilling other ecosystem process objectives as

envisioned in the ERPP.

Since the objective of this proposed project is to improve the options for stream temperature management on the Merced River, it will contribute toward optimization of water supply management and water quality for fish habitat. This is compatible and integral to CalFed objectives for water quality and water supply reliability.

### **E. Applicant Qualifications**

Merced ID staff will manage the project and administer the budget. The CDFG, USFWS, and NMFS will provide technical assistance with data acquisition and resource guidance. Merced ID will collaborate and coordinate with the latter three agencies throughout the project. NRS, Inc. will assist in the data acquisition and analyses, project coordination, bio-engineering components of the project, and project reporting requirements, including technical report writing. Merced ID selected NRS, Inc. for this project because of the firm's expertise on water project operations interrelationships with aquatic resources. NRS personnel have worked extensively throughout the western United States on investigations into freshwater habitat requirements and factors limiting fish populations and the development of measures to improve river and stream conditions for fishery resources. NRS, Inc. personnel were the primary individuals who authored the formal Biological Assessments (published, peer-reviewed reports) for the U.S. Bureau of Reclamations' Central Valley Project and Klamath Project. Merced ID and NRS, Inc. staff do not have any conflicts of interests associated with this project.

#### **Edward C. Selb III, Project Manager**

*Merced ID Assistant General Manager, Water Resources  
B.S., Business Administration, California State University, Sacramento*

Mr. Selb will serve as Project Manager for this project because of his extensive direct knowledge and expertise in Merced ID's water project operations. Mr. Selb currently manages three major departments of the Merced Irrigation District: the Merced River Development Project (New Exchequer and McSwain dams, powerhouses and reservoirs), the engineering department and the irrigation operations department. Mr. Selb has been employed with MID since July 1972. In 1991, Mr. Selb was named Assistant Manager/District Engineer, being placed in charge of the administration of the District's engineering and reservoir control operations. In 1996, Mr. Selb was appointed to his current position of Assistant General Manager, Water Resources. Mr. Selb has represented the District by serving on the Water Management & Environmental Committee of the Association of California Water Agencies (ACWA), and currently serves on the ACWA Groundwater Committee. Among his accomplishments, Mr. Selb played a major role in the successful development and preparation of a regional groundwater management plan for the Merced groundwater basin, involving 15 public agencies and private water companies. Mr. Selb also was instrumental in the development and preparation of the Merced Water Supply Plan, a three-year cooperative study with the City of Merced. Mr. Selb served as Vice Chairman of the Merced Water Supply Plan Technical Advisory Committee, and currently is a member of the

Merced Water Supply Plan Implementation Task Force. With his 27+ years of experience in water resources with the District, Mr. Selb is very knowledgeable and familiar with all aspects of the District's water operations.

**David Vogel, Assistant Project Manager/Senior Scientist**

*Natural Resource Scientists, Inc. Senior Scientist*

*M.S., 1979, Natural Resources (Fisheries), University of Michigan*

*B.S., 1974, Biology, Bowling Green State University*

Mr. Vogel will serve as Assistant Project Manager for this project because of his expertise and knowledge of the interrelationships of Merced ID's water project operations and fishery resources. Mr. Vogel specializes in aquatic resource assessments and resolution of fishery resource issues associated with land and water development. His 25 years of work experience in fisheries has included large-scale assessments in river systems, lakes and reservoirs, and estuaries. Most of his experience has been associated with restoration of western United States fishery resources. Mr. Vogel has worked as a biological consultant for the U.S. Bureau of Reclamation to define interrelationships of salmon resources and Central Valley Project water project operations. He was the Task Manager for the Biological Assessment of the 1992 operations of the Central Valley Project (CVP) and was the principal biologist in charge of developing the long-term Biological Assessment for the CVP. Mr. Vogel has been working on Central Valley fishery resource research and management projects and interrelationships with water project operations for 20 years, including seven years of experience working on Merced River fish habitat/water operations issues.

**Keith R. Marine, Project Ecologist**

*Natural Resource Scientists, Inc., Aquatic Ecologist*

*M.S., 1997, Ecology, University of California, Davis*

*B.S., 1983, Wildlife and Fisheries Biology, University of California, Davis*

Mr. Marine will serve as Project Ecologist for this project because of his expertise in ecological and thermal requirements of native fishes. Mr. Marine specializes in the ecological sciences with emphasis on fisheries science, aquatic and marine biology, and physiological ecology. He has extensive experience in ecological and biological assessment and conducting research directed at resolving natural resource management problems. Mr. Marine has designed and conducted ecosystem-level investigations on fish migration and behavior associated with operation of large Central Valley Project facilities, including fish responses to stream temperature alterations resulting from project operations. His expertise includes a comprehensive research background in thermal requirements and tolerances of California's native fishes, including Pacific anadromous salmonids. He has designed and performed temperature tolerance investigations and experiments for all the freshwater life phases of chinook salmon while working for the University of California, the U.S. Fish and Wildlife Service, and several water management agencies. Mr. Marine has performed evaluations of fish populations, fish habitat requirements, stream flow assessments and stream temperature modeling in support of fishery conservation and

restoration programs.

## **F. Cost**

### **1. Budget**

The budget for this project is shown in Table 2. The overall cost for this project is \$395,000 over two years. Overhead is 40 percent of total cost (far right column of Table 2) which includes workers compensation, office rent, phones, commercial general liability and professional liability insurance, state disability insurance, utilities, computer hardware and software, furniture, office equipment and supplies, and unbillable labor of support staff. Total cost for the project in the year 2001 is \$42,500 which includes \$40,000 for Task 1 and \$2,500 for Task 4. Total cost for the project in the year 2002 is \$352,500 which includes \$320,000 for Task 2 (including \$280,000 for competitive bid service contracts), \$30,000 for Task 3 (including \$25,000 for competitive bid service contracts), and \$2,500 for Task 4. The two service contracts will be awarded based on competitive bids according to CalFed guidelines. Details on the work for each task are described in the project approach section and the work schedule.

### **2. Cost Sharing**

Merced ID will provide \$75,000 of in-kind contributions which includes the entire project management contribution over two years to this project. The contributions will include Merced ID support staff work on all five tasks and overhead costs beyond that budgeted in this proposal. Merced ID will also continue and expand its extensive water temperature data collection program in the Merced River watershed to provide empirical data for calibration of CDFG's water temperature model (Figure 4) and input into the overall water temperature feasibility study. In addition, CDFG, USFWS, and NMFS will provide in-kind technical assistance with data acquisition and resource guidance for the project.

## **G. Local Involvement**

Merced ID and CDFG have jointly developed and agreed upon a 10-year study program to determine the potential factors that may limit salmon production in the Merced River. This program is designed to evaluate the habitats necessary for increased salmon production by assessing the needs for each freshwater salmon life stage (i.e., upstream migration, spawning, egg incubation, *fry* and juvenile rearing, and outmigration). The joint study program defines the objectives, basic experimental design, and the responsibilities for study implementation. The studies and instream flow scheduling will be coordinated with other studies throughout the San Joaquin basin and the Delta. Components of this program are presently underway. The completion of the 10-year program is intended to identify the long-term instream flow and other needs of salmon in the Merced River. To facilitate the studies, CDFG and Merced ID have established the Merced Management and Technical Advisory Committees; the latter committee establishes and coordinates study protocols, study amendments, funding issues, and information sharing and exchange. Merced ID and CDFG have been meeting as this committee over the past three years. In addition, USFWS and NMFS have begun participating in the Merced Technical

Table 2. Budget for the Merced River Water Temperature Feasibility Study.												
Year		Person/Position/Category	Direct Labor Hours	Salary	Benefits	Travel	Supplies & Expendables	Service Contracts	Overhead* (40 %)	Equipment	Exempt from Overhead Graduate Student Fee Remission	Total Cost
Year 1	Task 1	Dave Vogel, Senior Scientist	240	\$10,740	\$2,148				\$8,592			\$21,480
		Keith Marine, Aquatic Ecol.	300	\$7,502	\$1,520				\$8,082			\$15,204
		Expenses				\$2,500	\$818					\$3,318
	Task 4	Dave Vogel, Senior Scientist	12	\$537	\$107				\$439			\$1,074
		Keith Marine, Aquatic Ecol.	16	\$405	\$81				\$324			\$811
		Expenses				\$400	\$215					\$615
	Task 5	Project Management In-kind Contribution										\$0
Total Cost Year 1				\$18,284	\$3,857	\$2,900	\$1,031	\$0	\$15,428	\$0	\$0	\$42,500
Year 2	Task 2	Dave Vogel, Senior Scientist	140	\$11,098	\$2,219				\$9,889			\$22,127
		Keith Marine, Aquatic Ecol.	280	\$7,308	\$1,462				\$5,846			\$14,616
		Expenses				\$2,561	\$700					\$3,261
	Task 3							\$280,000				\$280,000
		Dave Vogel, Senior Scientist	45	2,074	415	852			\$1,659			\$5,000
								\$25,000				\$25,000
	Task 4	Dave Vogel, Senior Scientist	12	\$553	\$111				\$442			\$1,108
		Keith Marine, Aquatic Ecol.	16	\$418	\$84				\$334			\$835
		Expenses				\$344	\$214					\$558
	Task 5	Project Management In-kind Contribution										\$0
Total Cost Year 2				\$21,414	\$4,283	\$3,757	\$914	\$305,000	\$17,131	\$0	\$0	\$352,500
Total Project Cost				\$40,698	\$8,140	\$6,657	\$1,945	\$305,000	\$32,559	\$0	\$0	\$395,000

\* Overhead is 40% of total cost which includes workers compensation, office rent, phones, commercial general liability and professional liability insurance, state disability insurance, utilities, computer hardware and software, furniture, office equipment and supplies, and unbillable labor of support staff

Advisory Committee in the past two years on an ad-hoc basis until the committee is expanded and formalized to include a significantly broader stakeholder group. This multi-agency committee has endorsed this Merced River Water Temperature Feasibility Study.

With funding from the U.S. Fish and Wildlife Service Anadromous Fish Restoration Program and the CalFed Bay-Delta Program, the Merced County Planning and Community Development Department, with cooperation from Merced Irrigation District, have embarked on a collaborative effort to develop a restoration strategy for the Merced River corridor. This program will seek to join input from community stakeholders with a scientifically-based understanding of current river conditions and processes to identify a feasible corridor restoration strategy. Public involvement will play a key role in the restoration planning process, and public coordination will continue through the life of the project. To establish this role, the County, with Merced Irrigation District's assistance, has convened a Merced River Stakeholder Group. The Stakeholder Group represents a broad array of public and private interests, including local business and property owners; state, local, and federal agencies; fish and environmental groups; and other groups or individuals. In addition to working with his Stakeholder Group, the County has conducted regular workshops to keep the public informed of the project's progress. As a key stakeholder in this process on an ongoing basis, Merced ID will provide these groups with regular updates on the Merced River Water Temperature Feasibility Study. Merced ID has notified the Merced and Mariposa County Board of Supervisors and the County Planning Departments of this proposal. Copies of these notification letters are attached to this proposal.

Additionally, water temperature management in the Merced River watershed was identified as a high priority issue in the CalFed San Joaquin Regional Meeting and in the 2001 PSP (p. 47-48).

No third-party impacts are anticipated. Land use changes will not occur as a result of this project. Those parties who support restoration of San Joaquin fall-run chinook salmon that would benefit from the proposed project would also benefit.

## **H. Compliance with Standard Terms and Conditions**

The terms and conditions discussed in CalFed 2001 Proposal Solicitation Package are acceptable to the applicant. Forms 19 (Nondiscrimination Compliance), 4100 (Contracts with Public Entities), and 4099a (Additional Standard Clauses) are attached.

## **I. Literature Cited**

Bartholow, J.M.. 1989. Stream temperature investigations: Field and analytic methods. Instream Flow Information Paper; no. 13. U.S. Fish and Wildlife Service. Fort Collins, CO Biological Report 89 (17): 139p.

CalFed Bay-Delta Program. 1999a. Ecosystem Restoration Program Plan, Strategic Plan for Ecosystem Restoration. Draft Programmatic EIS/EIR Technical Appendix. June 1999.

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California Department of Fish and Game. 1993. Restoring Central Valley Streams: A Plan for Action. November 1993.

Fagerlund, U.H.M., J.R. McBride, and I.V. Williams. 1995. Stress and tolerance. Pages 459-504 in C. Groot, L. Margolis, and W.C. Clarke (eds). *Physiological Ecology of Pacific Salmon*. University of British Columbia Press. Vancouver, B.C. Canada.

Jones and Stokes Associates, Inc. 1995. Temperature and gravel investigations for fisheries enhancement on the lower Merced River, Merced County, California. April 1995. (JSA 92-211) Sacramento, CA. Prepared for State of California, The Resources Agency, Department of Fish and Game, Sacramento, CA.

Marine, K.R. 1993. A background investigation and review of the effects of elevated water temperature on reproductive performance of adult chinook salmon (*Oncorhynchus tshawytscha*), with suggestions for approaches to the assessment of temperature induced reproductive impairment of chinook salmon stocks in the American River, California, October 1992. University of California, Davis. Prepared for the American River Technical Advisory Committee, Sacramento, CA. 30p.

National Marine Fisheries Service. 1998. Endangered and Threatened Species: Proposed endangered status for two chinook salmon ESU's and proposed threatened status for five chinook salmon ESU's; Proposed redefinition, threatened status, and revision of critical habitat for one chinook salmon ESU; Proposed designation of chinook salmon critical habitat in California, Oregon, Washington, Idaho. March 9, 1998. Federal Register 63 (45): 11482-11520.

National Marine Fisheries Service. 2000. Designated Critical Habitat: Critical habitat for 19 evolutionary significant units of salmon and steelhead in Washington, Oregon, Idaho, California. February 16, 2000. Federal Register 65(32): 7764-7787.

Piper, R.G., I.B. McElwain, L.E. Orme, J.P. McCraren, L.G. Fowler, J.R. Leonard. 1982. *Fish Hatchery Management*. U.S. Fish and Wildlife Service. Washington, D.C. 517p.

Theurer, F.D., K.A. Voos, and W.J. Miller. 1984. Instream water temperature model. Instream Flow Information Paper: no. 16. U.S. Fish and Wildlife Service. Fort Collins, CO. FWS/OBS-84/15 v.p.

U.S. Fish and Wildlife Service. 1995. Working paper on restoration needs: Habitat restoration actions to double natural production of anadromous fish in the Central Valley of California.

## Merced River Water Temperature Management Feasibility Study

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Three volumes. May 1995. Prepared for the U.S. Fish and Wildlife Service under the direction of the Anadromous Fish Restoration Program Core Group. Stockton, CA.

U.S. Bureau of Reclamation. 1997. Central Valley Project Improvement Act, Draft Programmatic Environmental Impact Statement, Technical Appendix vol. 3: Fisheries. September 1997. Sacramento, CA.

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Yoshiyama, R.M., E.R. Gerstung, F.W. Fisher, and P.B. Moyle. 1996. Historical and present distribution of chinook salmon in the Central Valley drainage of California. Sierra Nevada Ecosystem Project: Final Report to Congress, Vol. 111, Assessments, Commissioned Reports, and Background Information. Chapter 7: 309-362.

Yoshiyama, R.M. 1999. A history of salmon and people in the Central Valley of California. Reviews in Fisheries Science 7(3&4): 197-239.

### **J. Threshold Requirements**

The letters of Notification, Environmental Compliance Checklist, Land Use Checklist, and contract forms are attached.





May 12,2000

Lydia Beiswanger, Clerk  
Merced Coounty Board of Supervisors  
2222 "M" Street  
Merced, CA 95340

Re: Intent to Submit a Proposal for CalFed Funding

Dear Board Members:

The CalFed Bay-Delta Program has solicited proposals for ecosystem restoration programs and projects to improve the health of the Bay-Delta ecosystem. The proposal submittals are due on May 15,2000.

In an effort to keep the Merced County Board of Supervisors informed of project applications of this nature, it is my great pleasure to announce that the Merced Imgation District (MID) is submittingthe attached proposal for a proposed study to be performed in Merced and Mariposa Counties, entitled: "Merced River Water Temperature Feasibility Study".

If you have any questions, please feel free to contact MID Assistant General Manager, Water Resources, Ted Selb, who has been designated as Project Manager for this important study.

Sincerely,

A handwritten signature in dark ink, appearing to read "Ross Rogers", is written over a light-colored rectangular background.

Ross Rogers  
General Manager

Enclosure

cc: Ted Selb, Assistant General Manager, Water Resources  
Ken Robbins, MID General Counsel  
Dave Vogel, Natural Resource Scientists, Inc.  
Marc Van Camp, Murray, Bums & Kienlen

# **MID** MERCED IRRIGATION DISTRICT

.....

May 12,2000

Bob Smith, Planning Director  
Merced County Planning and  
**Community** Development Dept.  
2222 "M" Street  
Merced, CA 95340

Re: Intent to Submit a Proposal for CalFed Funding

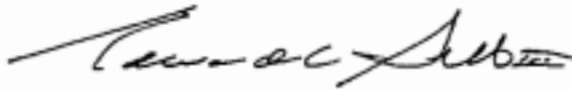
Dear Mr. Smith:

The CalFed Bay-Delta Program has solicited proposals for ecosystem restoration programs and projects to improve the health of the Bay-Delta ecosystem, The proposal submittals are due on May 15,2000.

In an effort to keep Merced County informed of project applications of this nature, it is my great pleasure to announce that the Merced Irrigation District (**MID**) is submitting the attached proposal for a proposed study to be performed in Merced and Mariposa Counties, entitled 'Merced River Water Temperature Feasibility Study'.

If you have any questions, please feel free to contact **MID** Assistant General Manager, Water Resources, Ted Selb, who has been designated as Project Manager for this important study.

Sincerely,



*for* Ross Rogers  
General Manager

Enclosure

cc: Ted Selb, Assistant General Manager, Water Resources  
Ken Robbins, MID General Counsel  
Dave Vogel, Natural Resource Scientists, Inc.  
Marc Van Camp, Murray, Bums & Kienlen

# **MID** MERCED IRRIGATION DISTRICT

May 12,2000

Clerk of the Board  
Mariposa County Board of Supervisors  
PO Box **784**  
Mariposa, CA **95338**

Re: Intent to Submit a Proposal for CalFed Funding

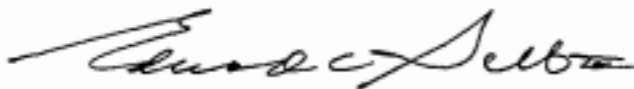
Dear Board Members:

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If you have any questions, please feel free to contact **MID** Assistant General Manager, Water Resources, Ted Selb, who has been designated as Project Manager for this important study.

Sincerely,



*for* Ross Rogers  
General Manager

Enclosure

cc: Ted Selb, Assistant General Manager, Water Resources  
Ken Robbins, MID General Counsel  
Dave Vogel, Natural Resource Scientists, Inc.  
Marc Van Camp, Murray, Bums & Kienlen

# MID MERCED IRRIGATION DISTRICT

May 12, 2000

Mariposa County Planning Department  
PO Box 2039  
Mariposa, CA 95338

Re: Intent to Submit a Proposal for CalFed Funding

Dear **Sirs:**

The CalFed Bay-Delta Program has solicited proposals for ecosystem restoration programs and projects to improve the health of the Bay-Delta ecosystem. The proposal submittals are due on May 15, 2000.

In an effort to keep Mariposa County informed of project applications of **this** nature, it is my great pleasure to announce that the Merced Irrigation District (**MID**) is submitting the attached proposal for a proposed study to be performed in Mariposa and Merced Counties, entitled: "Merced River Water Temperature Feasibility Study".

If you have any **questions**, please feel free to contact **MID** Assistant General Manager, Water Resources, Ted Selb, who has been designated as Project Manager for this important study.

Sincerely,



for Ross Rogers  
General Manager

Enclosures

cc: Ted Selb, Assistant General Manager, Water Resources  
Ken Robbins, MID General Counsel  
Dave Vogel, Natural Resource Scientists, Inc.  
Marc Van Camp, Murray, Bums & Kienlen

# **MID** MERCED IRRIGATION DISTRICT

May 12,2000

Mariposa County Planning Department  
PO **Box** 2039  
Mariposa, CA 95338

Re: Intent to Submit a Proposal for CalFed Funding

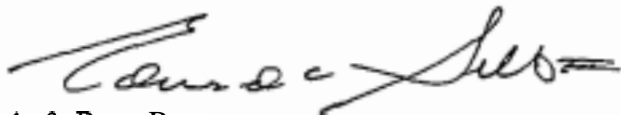
Dear Sirs:

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In an effort to keep Mariposa County informed of project applications of this nature, it is my great pleasure to announce that the Merced Irrigation District (**MID**) is submitting the attached proposal for a proposed study to be performed in Mariposa and Merced Counties, entitled "Merced River Water Temperature Feasibility Study".

If you have any questions, please feel free to contact MID Assistant General Manager, Water Resources, Ted Selb, who has been designated as Project Manager for this important study.

Sincerely,



for Ross Rogers  
General Manager

Enclosures

cc: Ted Selb, Assistant General Manager, Water Resources  
Ken Robbins, MID General Counsel  
Dave Vogel, Natural Resource Scientists, Inc.  
Marc Van Camp, Murray, Bums & Kienlen

**All applicants must fill out this Environmental Compliance Checklist. Applications must contain answers to the following questions to be responsive and to be considered for funding. Failure to answer these questions and include them with the application will result in the application being considered nonresponsive and not considered for funding.**

- YES**

X  
NO

- Lead Agency

- The project proposal is a feasibility study.

5. **Will the applicant require access across public or private property that the applicant does not own to accomplish the activities in the proposal?**

**YES**

**X**  

---

**NO**

**If yes, the applicant must attach written permission for access from the relevant property owner(s). Failure to include written permission for access may result in disqualification of the proposal during the review process. Research and monitoring field projects for which specific field locations have not been identified will be required to provide access needs and permission for access with 30 days of notification of approval.**

6. Please indicate what permits or other approvals may be required for the activities contained in your proposal. Check all boxes that apply.

**LOCAL**

Conditional use permit	<input type="checkbox"/>
Variance	<input type="checkbox"/>
Subdivision Map Act approval	<input type="checkbox"/>
Grading permit	<input type="checkbox"/>
General plan amendment	<input type="checkbox"/>
Specific plan approval	<input type="checkbox"/>
Rezone	<input type="checkbox"/>
Williamson Act Contract	<input type="checkbox"/>
cancellation	<input type="checkbox"/>
Other _____	
(please specify)	<input checked="" type="checkbox"/>
None required	<input type="checkbox"/>

**STATE**

CESA Compliance	<input type="checkbox"/>	(CDFC)
Streambed alteration permit	<input type="checkbox"/>	(CDFG)
CWA § 401 certification	<input type="checkbox"/>	(RWQCB)
Coastal development permit	<input type="checkbox"/>	(Coastal Commission/BCDC)
Reclamation Board approval	<input type="checkbox"/>	
Notification	<input type="checkbox"/>	(DPC, BCDC)
Other _____		
(please specify)	<input checked="" type="checkbox"/>	
None required	<input type="checkbox"/>	

**FEDERAL**

ESA Consultation	<input type="checkbox"/>	(USFWS)
Rivers & Harbors Act permit	<input type="checkbox"/>	(ACOE)
CWA § 404 permit	<input type="checkbox"/>	(ACOE)
Other _____		
(please specify)	<input checked="" type="checkbox"/>	
None required	<input type="checkbox"/>	

DPC = Delta Protection Commission  
 CWA = Clean Water Act  
 CESA = California Endangered Species Act  
 USFWS = U.S. Fish and Wildlife Service  
 ACOE = U.S. Army Corps of Engineers

ESA = Endangered Species Act  
 CDFG = California Department of Fish and Game  
 RWQCB = Regional Water Quality Control Board  
 BCDC = Bay Conservation and Development Comm.

# Land Use Checklist

All applicants must fill out this Land Use Checklist for their proposal. Applications must contain answers to the following questions to be responsive and to be considered for funding. Failure to answer these questions and include them with the application will result in the application being considered nonresponsive and not considered for funding.

1. Do the actions in the proposal involve physical changes to the land (i.e. grading, planting vegetation, or breeching levees) or restrictions in land use (i.e. conservation easement or placement of land in a wildlife refuge)?

\_\_\_\_\_  
YES

~~\_\_\_\_\_  
NO~~

2. ,If NO to # 1, explain what type of actions are involved in the proposal (i.e., research only, planning only).

**Research and planning only.**

3. If YES to # 1, what is the proposed land use change or restriction under the proposal?

4. If YES to # 1, is the land currently under a Williamson Act contract?

\_\_\_\_\_  
YES

~~\_\_\_\_\_  
NO~~

5. If YES to # 1, answer the following:

Current land use

Current zoning

Current general plan designation

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

6. If YES to #1, is the land classified as Prime Farmland, Farmland of Statewide Importance or Unique Farmland on the Department of Conservation Important Farmland Maps?

\_\_\_\_\_  
YES

~~\_\_\_\_\_  
NO~~

~~\_\_\_\_\_  
DON'T KNOW~~

7. If YES to # 1, how many acres of land will be subject to physical change or land use restrictions under the proposal?

\_\_\_\_\_

8. If YES to # 1, is the property currently being commercially farmed or grazed?

\_\_\_\_\_  
YES

~~\_\_\_\_\_  
NO~~

9. If YES to #8, what are

the number of employees/acre \_\_\_\_\_

the total number of employees \_\_\_\_\_



**10. Will the applicant acquire ~~any~~ interest in land under the proposal (fee title or a conservation easement)?**

**YES**

NO

**11. What entity/organization will hold the interest?**

**12. If YES to # 10, answer the following:**

Total number of acres to be acquired under proposal

Number of acres to be acquired in fee

Number of acres to be subject to conservation easement

**13. For all proposals involving physical changes to the land or restriction in land use, describe what entity or organization will:**

manage the property

provide operations and maintenance services

conduct monitoring

**14. For land acquisitions (fee title or easements), will existing water rights also be acquired?**

**YES**

**NO**

15. Does the applicant propose ~~any~~ modifications to the water right ~~or~~ change in the delivery of the water?

**YES**

**X**  
**NO**

**16. If YES to # 15, describe** \_\_\_\_\_

## NONDISCRIMINATION COMPLIANCE STATEMENT

STD. 19 (REV. 3-1-85) FMC

COMPANY NAME

Merced Irrigation District

The company named above (hereinafter referred to as "prospective contractor") hereby certifies, unless specifically exempted, compliance ~~with~~ Government Code Section 12990(a-f) and California Code of Regulations, Title 2, Division 4, Chapter 5 in matters relating to reporting requirements and the development, implementation and maintenance of a Nondiscrimination Program. Prospective contractor agrees not to unlawfully discriminate, harass or allow harassment against **any** employee or applicant for employment because of sex, race, color, ancestry, religious creed, national origin, disability (including HIV and AIDS), **medical** condition (cancer), age, marital status, denial of family and medical care leave and denial of pregnancy disability leave.

## CERTIFICATION

I, the official named below, hereby swear that I **am duly** authorized to legally **bind** the prospective contractor to the above described certification. I am fully aware that this certification, executed on the date and in the county **below**, is made under penalty of perjury under the laws of the State of California

OFFICIAL'S NAME

for Ross Rogers

DATE EXECUTED

May 12, 2000

EXECUTED IN THE COUNTY OF

Merced

PROSPECTIVE CONTRACTOR'S SIGNATURE

PROSPECTIVE CONTRACTOR'S TITLE

General Manager

PROSPECTIVE CONTRACTOR'S LEGAL BUSINESS NAME

Merced Irrigation District

## STANDARD CLAUSES - CONTRACTS WITH PUBLIC ENTITIES

**Workers' Compensation Clause.** Contractor affirms that it is aware of the provisions of Section 3700 of the California Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that Code, and Contractor affirms that it will comply with such provisions before commencing the performance of the work under this contract.

**Nondiscrimination Clause.** During the performance of this contract, the recipient, Contractor and its subcontractors shall not deny the contract's benefits to any person on the basis of religion, color, ethnic group identification, sex, age, physical or mental disability, nor shall they discriminate unlawfully against any employee or applicant for employment because of race, religion, color, national origin, ancestry, physical handicap, mental disability, medical condition, marital status, age (over 40), or sex. Contractor shall insure that the evaluation and treatment of employees and applicants for employment are free of such discrimination. Contractor shall comply with the provisions of the Fair Employment and Housing Act (Government Code Section 12900 et seq.), the regulations promulgated thereunder (California Administrative Code, Title 2, Sections 7285.0 et seq.), the provisions of Article 9.5, Chapter 1, Part 1, Division 3, Title 2 of the Government Code (Government Code Sections 11135 - 11139.5), and the regulations or standards adopted by the awarding State agency to implement such article. Contractor or recipient shall permit access by representatives of the Department of Fair Employment and Housing and the awarding State agency upon reasonable notice at any time during the normal business hours, but in no case less than 24 hours' notice, to such of its books, records, accounts, other sources of information and its facilities as said Department or Agency shall require to ascertain compliance with this clause. Recipient, Contractor and its subcontractors shall give written notice of their obligations under this clause to labor organizations with which they have a collective bargaining or other agreement. The Contractor shall include the nondiscrimination and compliance provisions of this clause in all subcontracts to perform work under the contract.

**Availability of Funds.** Work to be performed under this contract is subject to availability of funds through the State's normal budget process.

**Audit Clause.** For contracts in excess of \$10,000, the contracting parties shall be subject to the examination and audit of the State Auditor for a period of three years after final payment under the contract. (Government Code Section 8546.7).

**Payment Retention Clause.** Ten percent of any progress payments that may be provided for under this contract shall be withheld per Public Contract Code Sections 10346 and 10379 pending satisfactory completion of all services under the contract.

**Reimbursement Clause.** If applicable, travel and per diem expenses to be reimbursed under this contract shall be at the same rates the State provides for unrepresented employees in accordance with the provisions of Title 2, Chapter 3, of the California Code of Regulations. Contractor's designated headquarters for the purpose of computing such expenses shall be: \_\_\_\_\_

**Drug-Free Workplace Certification.** By signing this contract, the Contractor or grantee hereby certifies under penalty of perjury under the laws of the State of California that the Contractor or grantee will comply with the requirements of the Drug-Free Workplace Act of 1990 (Government Code Section 8350 et seq.) and will provide a drug-free workplace by taking the following actions:

1. Publish a statement notifying employees that unlawful manufacture, distribution, dispensation, possession, or use of a controlled substance is prohibited and specifying actions to be taken against employees for violations.
2. Establish a Drug-Free Awareness Program to inform employees about all of the following:
  - (a) The dangers of drug abuse in the workplace,
  - (b) The person's or organization's policy of maintaining a drug-free workplace,
  - (c) Any available counseling, rehabilitation and employee assistance programs, and
  - (d) Penalties that may be imposed upon employees for drug abuse violations.
3. Every employee who works on the proposed contract or grant:
  - (a) Will receive a copy of the company's drug-free policy statement, and
  - (b) Will agree to abide by terms of the company's statement as a condition of employment on the contract or grant.

This contract or grant may be subject to suspension of payments or termination, or both, and the Contractor or grantee may be subject to debarment if the department determines that: (1) the Contractor or grantee has made a false certification, or (2) the Contractor or grantee violates the certification by failing to carry out the requirements noted above.

**Americans With Disabilities Act.** By signing this contract, Contractor assures the State that it complies with the Americans With Disabilities Act (ADA) of 1990, (42 U.S.C. 12101 et seq.), which prohibits discrimination on the basis of disability, as well as all applicable regulations and guidelines issued pursuant to the ADA.

**Former State Employees:** a) For the two-year period from the date he or she left State employment, no former State officer or employee may enter into a contract in which he or she engaged in any of the negotiations, transactions, planning, arrangements or any part of the decision-making process relevant to the contract while employed in any capacity by any State agency. b) For the twelve-month period from the date he or she left State employment, no former State officer or employee may enter into a contract with any State agency if he or she was employed by that State agency in a policy-making position in the same general subject area as the proposed contract within the twelve-month period prior to his or her leaving State service.

Agreement No. \_\_\_\_\_

Exhibit \_\_\_\_\_

**ADDITIONAL STANDARD CLAUSES**

**Recycled Materials.** Contractor hereby certifies under penalty of perjury that \_\_\_\_\_ (enter value or "0" here) percent of the materials, goods and supplies offered or products used in the performance of this Agreement meets or exceeds the minimum percentage of recycled material as defined in Sections 12161 and 12200 of the Public Contract Code.

**Severability.** If any provision of this Agreement is held invalid or unenforceable by any court of final jurisdiction, it is the intent of the parties that all other provisions of this Agreement be construed to remain fully valid, enforceable, and binding on the parties.

**Governing Law.** This Agreement is governed by and shall be interpreted in accordance with the laws of the State of California.

**YZK Language.** The Contractor warrants and represents that the goods or services sold, leased, or licensed to the State of California, its agencies, or its political subdivisions, pursuant to this Agreement are "Year 2000 compliant." For purposes of this Agreement a good or service is Year 2000 compliant if it will continue to fully function before, at, and after the Year 2000 without interruption and, if applicable, with full ability to accurately and unambiguously process, display, compare, Calculate, manipulate, and otherwise utilize date information. This warranty and representation supersedes all warranty disclaimers and limitations and all limitations on liability provided by or through the Contractor.

**Child Support Compliance Act.** For any Agreement in excess of \$100,000, the Contractor acknowledges in accordance therewith, that:

1. The Contractor recognizes the importance of child and family support obligations and shall fully comply with all applicable state and federal laws relating to child and family support enforcement, including, but not limited to, disclosure of information and compliance with earnings assignment orders, as provided in Chapter 8 (commencing with Section 5200) of Part 5 of Division 9 of the Family Code; and
2. The Contractor, to the best of its knowledge, is fully complying with the earnings assignment orders of all employees and is providing the names of all new employees to the New Hire Registry maintained by the California Employment Development Department.